

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

X. Tang et al.

Serial No.: 10/754,176

Group Art Unit: 2879

Filed: January 9, 2004

Examiner: K.J. Quarterman

For: FIELD EMISSION BACKLIGHT FOR LIQUID CRYSTAL TELEVISIONS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

DECLARATION UNDER 37 C.F.R. § 1.131

1. I, Theodore Schmitt, am an employee of Electrovac AG and am not an inventor of the subject matter claimed in the above-referenced patent application.

2. I possess the necessary technical background and knowledge in the field of the invention to understand the invention, and I have reviewed the specification and claims of the above-referenced patent application.

3. I have first hand knowledge that the subject matter of the claimed invention was reduced to practice prior to May 13, 2003.

a. I was present on October 17, 2002, when fabrication of a prototype device, referenced as sample no. V171002a, was completed, according to the method described in the subject matter of the above-referenced patent application, and was tested.

b. Exhibit A is a report of an experimental protocol for a device comprised of a cathode of carbon nanofibers grown in nanofiber clusters on an aluminum-coated glass substrate and an anode, according to the method of fabrication described in the above-referenced patent application. The device was fabricated to have a space between the cathode and the anode. The copy attached as Exhibit A is a true and accurate copy of the report, which was saved on the server of Electrovac AG.

c. Exhibit B is a true and accurate copy, which shows the date of the first test, on November 20, 2002, for a field emissive device with a 100% emitting area, which was saved on the server of Electrovac AG. I was present on November 20, 2002, at the successful testing of another field emissive device, made according to the method described in the above-referenced patent application, referenced as sample no. V181102b-2, which successfully emitted light over 100% of the area of the cathode as shown in the images shown in Exhibit C .

4. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application and any patent issuing thereon.

Dated: June 13, 2006


Theodore Schmitt

Field Emission of Carbon Nanotubes

Sample: V171002a

Substrate: Al Glass, Catalyst: D5 (Ni-Fe), Screen print Philips

Space: Mica, 300µm, Anode: ITO-Phosphor, FE Area: 1.5x1.7cm², pixel 14%

First measure: 17.10.2002, 16:00, P=5.8x10⁻⁵ mbar

Voltage (V)	Current (µA)	Field (V/µm)	Current density (µA/Cm ²)
1000	0,12	3,3	0,33
1100	1,72	3,7	4,8
1200	8,05	4	22,5
1300	23,8	4,3	66,6
1400	46,4	4,7	130
1500	67,6	5	189,3
1600	91,7	5,3	256,9
1700	126,9	5,7	355,4
1800	176,3	6	493,8
1900	245,9	6,3	688,8
2000	329	6,7	921,4

second measure: 18.10.2002, 8:00 (16h later), P=1.1x10⁻⁶ mbar

Voltage (V)	Current (µA)
1000	0,17
1100	1,52
1200	9,46
1300	26,24
1400	51,6
1500	74,1
1600	92,2
1700	123
1800	172,6
1900	244,9
2000	329,6

EXHIBIT A

This is a page from ELECTRON
computer saved under
G/USER/Gr-FE/Carbon Nanotubes
/projekte/FED-EVAC-PAG-LG
and it is witnessed by

DR. THEODORE SCHMIDT

Theodore Schmidt
6.06.2006

V	messung 2002-11-20
600	0,25
700	0,58
800	1,64
900	18,6
1000	72,6
1100	137
1200	202
1300	258
1400	305
1500	376
1600	470
1700	583
1800	700
1900	826
2000	953

messung 2002-11-26	field V/ μ m	Current density (μ A/cm ²)	space 250 μ m, area 1,76
600	2,4	0,3	
700	2,8	0,8	
800	3,2	2,3	
900	3,6	39,2	
1000	4	173,0	
1100	4,4	366,5	
1200	4,8	542,6	
1300	5,2	679,0	
1400	5,6	835,2	
1500	6	1054,0	
1600	6,4	1335,2	
1700	6,8	1650,6	
1800	7,2	1994,3	
1900	7,6	2358,0	
2000	8	2715,9	

EXHIBIT B

This is a page from ELEKTRO
computer saved under
G/USER/Gr-FE/Carbon Nanotube
/projekte/FED-EVAC-PAG-LGP
and it is witnessed by

DR. THEODORE SCHMITT
H. Schmitt
G.O.B. 2006

Report Nov-2. 2002

CNT Cathode (CVD No. V181102b-2) emits uniformly as shown as follows. The cathodes with size 65cm² which are measured at LGP Display (measure No.6 corresponding CVD No. V111102a-1 and measure No.7 corresponding CVD No. V111102a-2) emits all over the area at very lower field 1.5-2V/ μ m, and it will be reported some time later.

Field Emission of CNT cathode (sample No. V181102b-2)

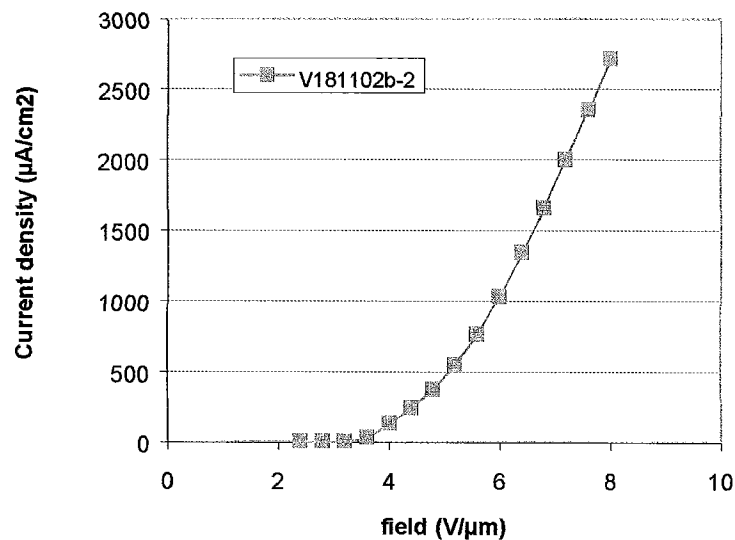


EXHIBIT C

This is a page
from ELECTROVAC
computer saved
under
G/USER/Gr-FE/
Carbon Nanotubes/
projekte/FED-EVAC
-PAG/LGphilips
and it is witnessed

by
DR. THEODORE
SCHMITT

[Signature]
6.06.2002